



Organizational Overview

Quality Engineering Directorate

Presented To The

TACOM QUALITY FEDERATION

15 April 1999

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Director, Quality
Engineering

Tank-automotive & Armaments

COMmand

QUALITY ENGINEERING DIRECTORATE

BRIEFING OUTLINE

- ***DEFINITION / MISSION**
- ***ORGANIZATION**
- ***EMPLOYEE PROFILE**
- ***MAJOR FUNCTIONS**
- ***FACILITIES**
- ***QED CUSTOMERS**
- ***CONCLUSIONS**



<http://qa.pica.army.mil>

QUALITY ENGINEERING DIRECTORATE



VISION:

Providing Superior Quality Firepower

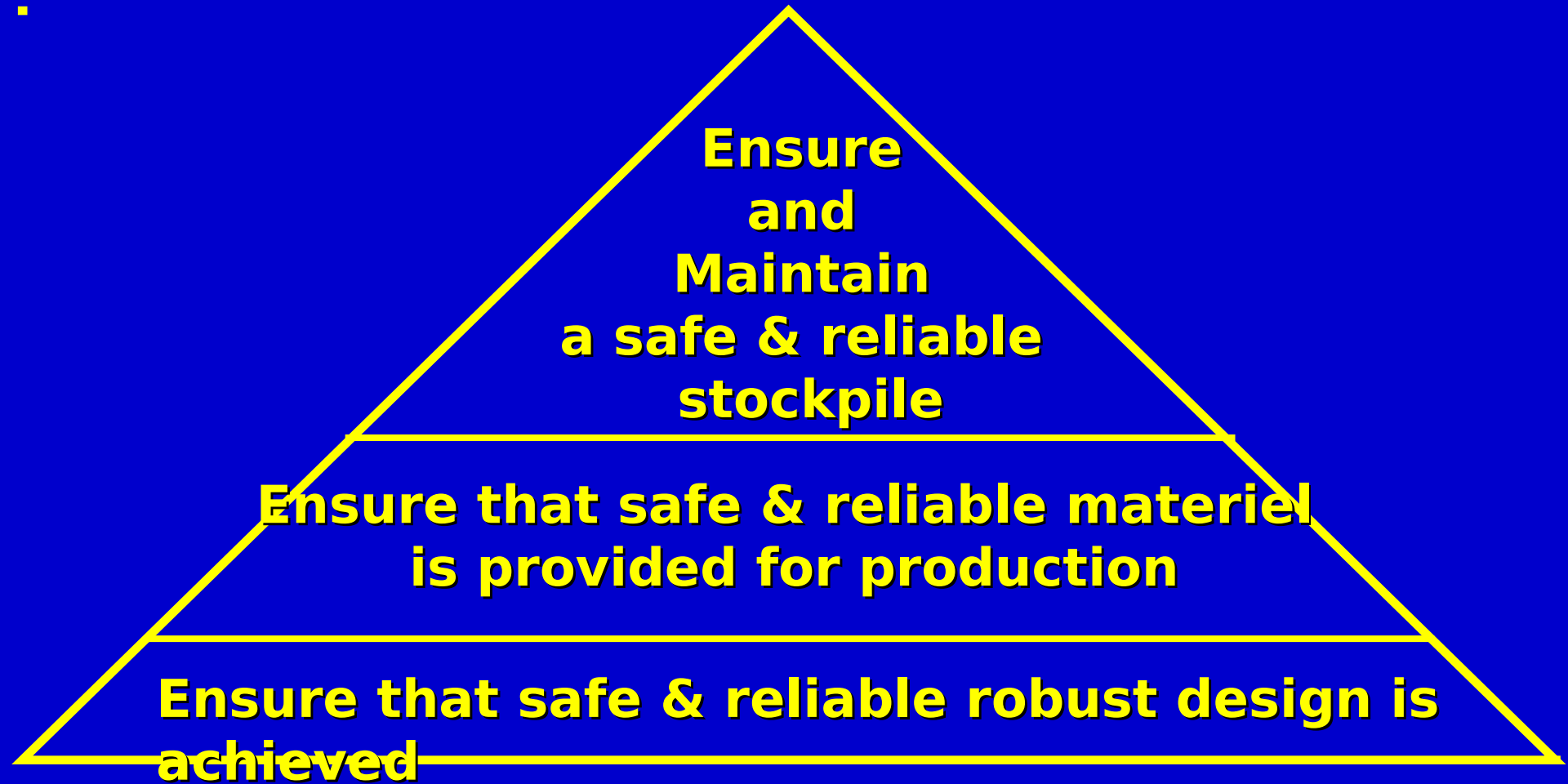
MISSION:

Providing outstanding Quality, Reliability, Safety Engineering, Assessments, and Engineering Data Management for the development and fielding of the Army's Armaments

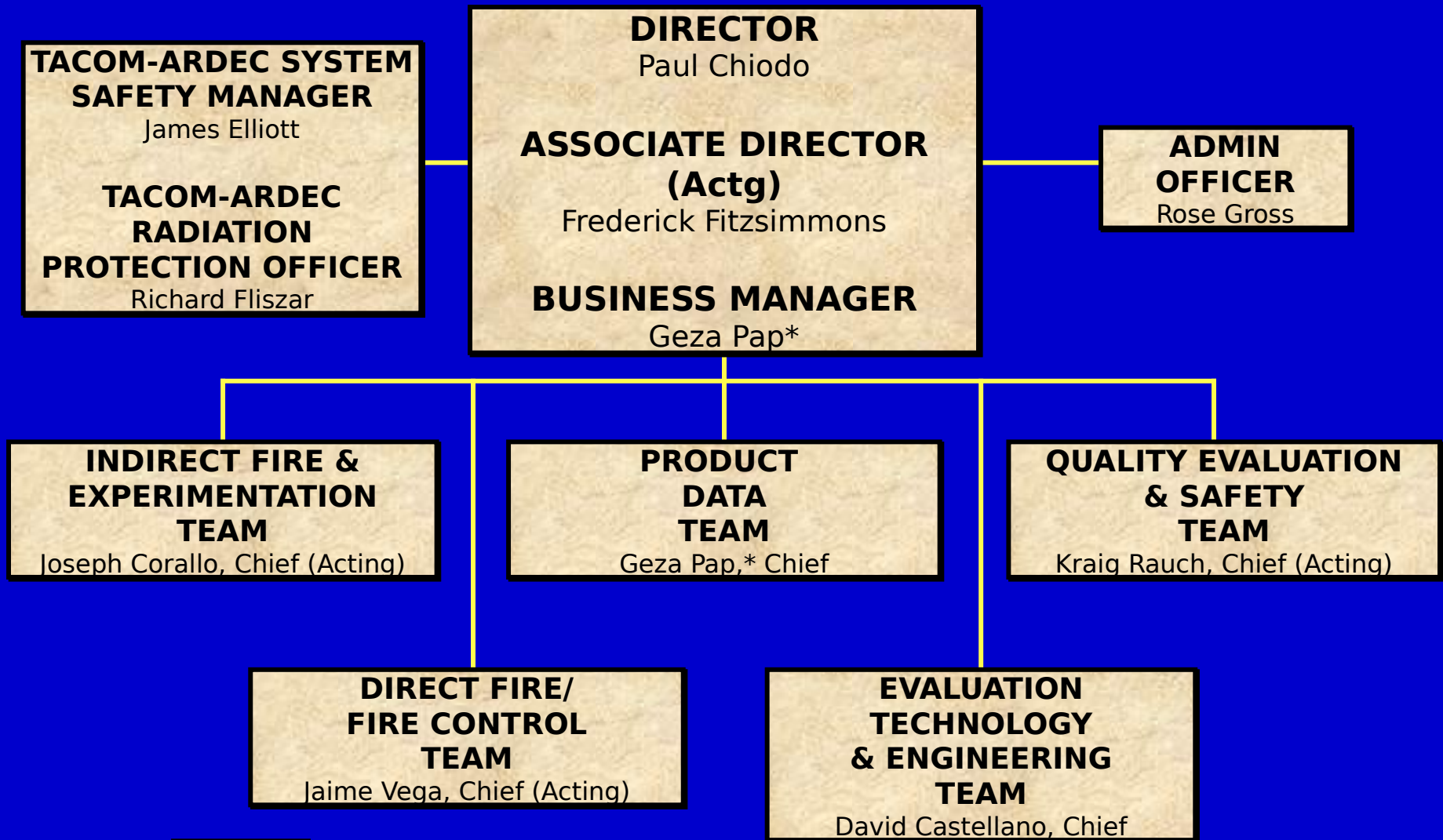
GOALS:

- 1. Provide the highest standards in quality engineering with timely and cost effective services to our customers.**
- 2. Assure independent assessment of development and production programs throughout the materiel acquisition life cycle.**
- 3. Develop employees as team members supporting acquisition reform through integrated product teams.**
- 4. Maintain state of the art facilities, capabilities and technologies**

Engineering Effort Throughout System Life Cycle



ORGANIZATION STRUCTURE



*Dual Hat

FUNCTIONS

Direct Fire / Fire Control Team & Indirect Fire & Experimentation Team

Quality Engineering

- Program-Unique and Performance Specifications
- Statistical Process Control (SPC)
- Design of Experiments (Taguchi)
- Quality Functional Deployment
- First Article Test & Lot Acceptance Test
- Procurement Quality Assurance (i.e.: QALI, QDR)
- Contract SOW & Solicitation
- Source Selection Evaluation Board
- Acceptance Sampling

Quality Engineering

- Materiel Developer Analysis (MDA)
- Reliability Prediction
- Failure Modes, Effects and Criticality Analysis
- Sneak Circuit Analysis
- Fault Tree Analysis
- Failure Analysis

Experimentation

- Test Instrumentation Engineering.
- Accept. Insp. Equip.
- Testing Technology
- Non-Destructive Test
- Soldering

FUNCTIONS

Evaluation Technology & Engineering Team

- PSM/Performance Management
- OSD Policy Support
- Tri-Service IPT
- Software Policy
- Software Ind. Veri. & Vali.
- Software Safety & Rel. Eng.
- Software Material
- Predictive Engineering
- Ammunition Stockpile Reliability Program
- Energetics & Propellants
- Environmental Assurance

Quality Evaluation & Safety Team

- (CP)²
- CPC/RAM
- Failure Analysis
- First Article Test
- Evaluation
- Scratch & Digs
- Standardization
- QSL
- Materiel Release
- Math/Stat
- Policy/Warranty
- PQM's

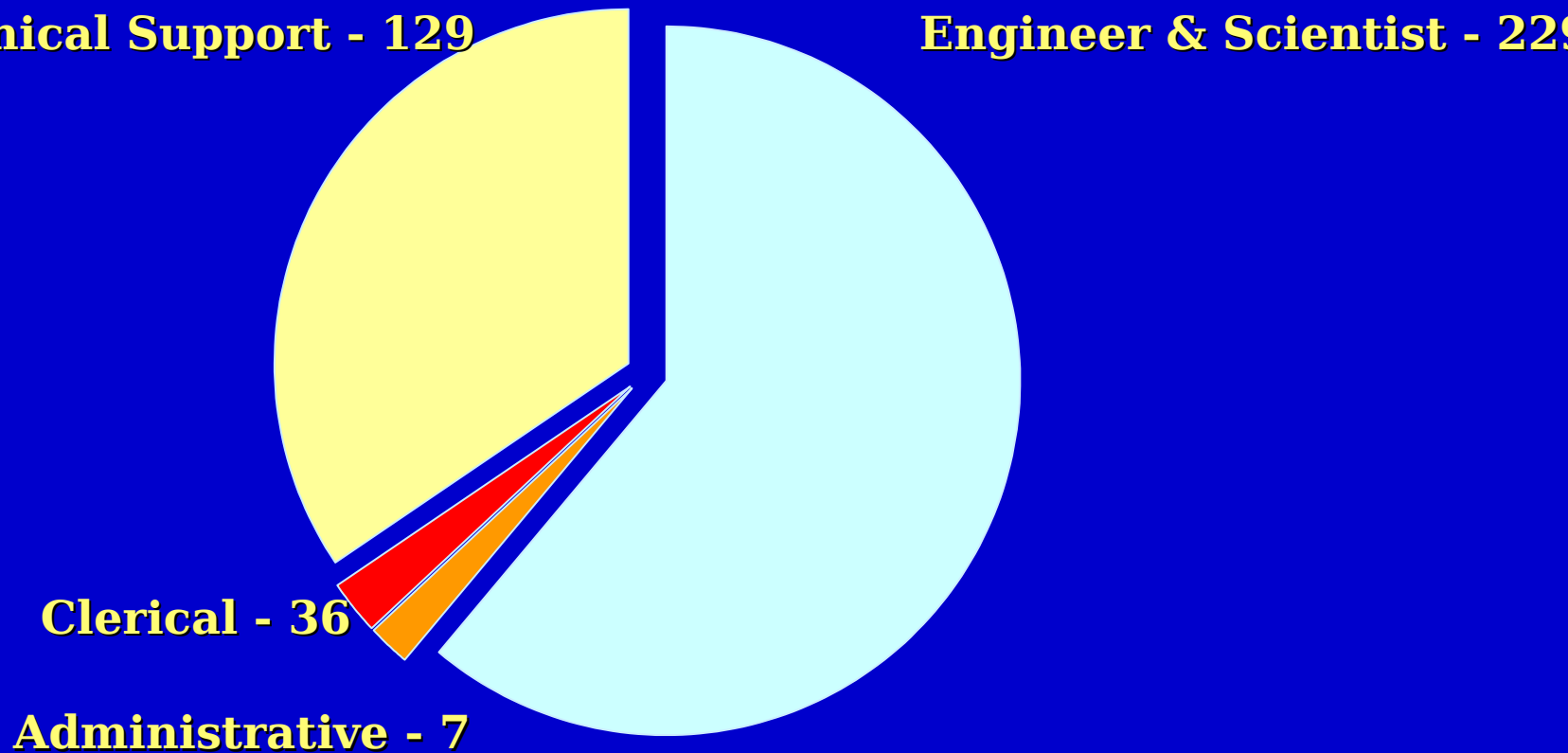
System Safety Group

- Explosive Haz Classification
- Surface Danger Zone
- Radiation Safety
- System Safety Haz Analysis
- Army Fuze Safety Rev Board
- Safety Assessment Rep (SAR)
- System Safety Management Plan (SSMP)

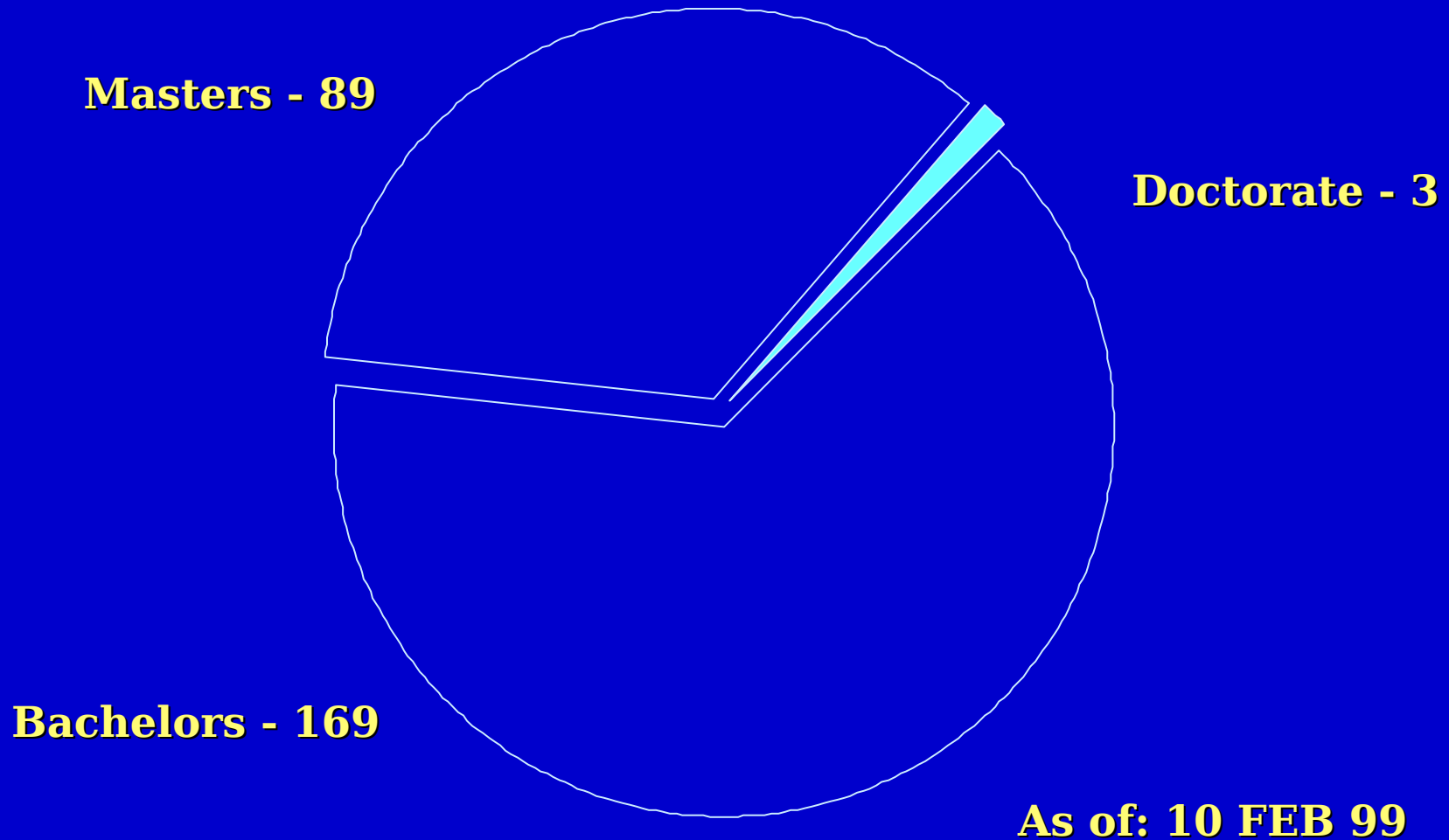
Product Data Team

- Joint Engineering Data Management Information Control System (JEDMICS)
- Munitions and Weapons Technical Data Repository
- Defense Logistics Agency (DLA) Interface
- Technical Data Configuration Management System (TDCMS)

PROFILE BY SKILL CATEGORY



EDUCATIONAL BREAKDOWN



QUALITY FEDERATION ORGANIZATION (ARDEC QED LEAD)



HOMEBASE SUPERVISED CORE CAPABILITIES

**1. Acquisition Quality
Reliability/Quality
Assurance**

6.

Engineering

**2. Fielded Systems
Quality
Quality Assurance**

7. Software

Assurance

**3. Policy
Standardization**

8.

**4. Product Verification
Safety**

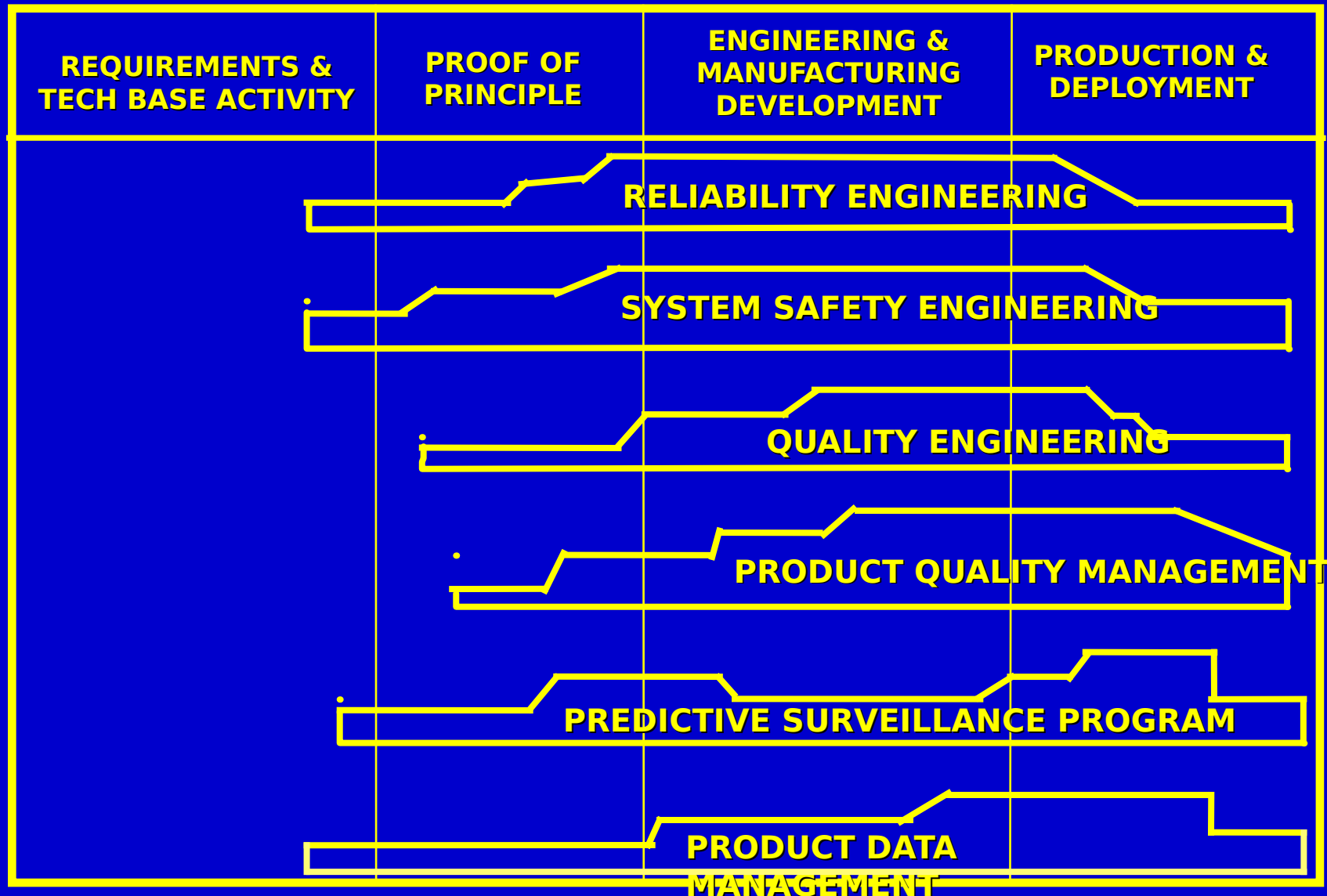
9. System

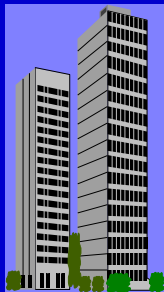
Homebase Supervised Core Capability	Mission	Functions	Objectives
Acquisition Quality Assurance	Provide quality assurance provisions and supplier management/oversight to ARDEC and customer acquisitions	(CP)2, Qualified Supplier Lists, Quality Audits, Contractor Improvements, SOW inputs, Pre/Post Award Audits, QALIs, Source Selection, Negotiations, Soldering Expertise f/Industry	Effective contract execution with optimal risk/schedule/cost and quality balance. Optimally defined QA requirements to insure safety and reliability of developmental and fielded materiel.
Fielded System Quality Assurance	Provide soldier interface on the prevention and correction of fielded materiel problems	QDRs, Malfunction/Deficiency Investigations, Stockpile Reliability & Support, Fielding Teams	Facilitate maintaining inventory at high readiness state and high soldier satisfaction with ARDEC and customer mission materiel.
Policy	Establish QA home base operational processes and assure higher HQ's awareness of needs and initiatives related to ARDEC items	Materiel Release; Readiness for Test Reviews; Corrosion Prevention and Control; Statistical Techniques; Configuration and Engineering Data Practices; interface to AMC and MSCs	Maintain ARDEC as a leading edge home base for QA practices; assume TACOM lead under the Tacom of the Future concept
Product Verification	Management and execution of the verification of design/product performance in accordance with requirements	PCAs, Witness/Score Tests, FATs, LATs, Testing Technology, Predictive Technology	ARDEC customer mission items that demonstrate through tests/examinations to have meet their requirements. Verify by utilization of varied evaluation methods that systems are of the highest quality achievable.
Radiation Protection Program	Ensure ARDEC's radioactive materials are effective and compliant to laws	NRC license compliance activities: inventory, guidance, audit and reporting	No risk to staff nor personal/legal liability to leadership
Reliability/Quality Engineering	Perform RAM and Quality Engineering tasks, and provide skilled experienced staff to ARDEC and customer programs	Requirement/System Dev Documents, RAM Engr, TIWG,TEMPs, Specs, Design Rev, TDP Dev & Maint , Test Management, Insp Equip, RFW/RFD, Material Release, Failure Analysis, Predictive Technology	Support the achievement of robust ARDEC designs which demonstrate achievement of user needs and can be manufactured effectively. Support ARDEC's objectives to team effectively to the best advantage of the soldier
Software Quality Assurance	Perform software quality assurance on ARDEC and customer battlefield automation programs	Software Metrics, IV&V, Software Reliability. Software Testing, Software Audits	Robust, mature, reliable and maintainable software for ARDEC and customer systems.
Standardization	Operate the DoD Standardization Activity known as AR, and ARDEC QA related international standardization activities	Class V DoD item related specifications, standards and related industry, NATO and OGA interfaces	ARDEC practices in the specs and standards area which reflect DoD guidance, industry best practices and effective implementation
System Safety	Support ARDEC and customer programs with systems safety and hazard classification expertise	System Safety Analysis & Implementation, Final Hazard Classification, SARs, SSRAs, Support to Fuze Safety Board, Safety Fault Trees	Less than 1/million hazard rate for ARDEC mission materiel. Identify and address all safety related factors so as to eliminate risk in usage
Technical Data Management	Operate the Armament Technical/Product Data repository	Store, maintain and safeguard legacy item and new design technical data; provide customers with full TDPs and/or extracts	Accurate/current state of stored documents; efficient and low cost retrieval to meet customer expectations

QED MAJOR FUNCTIONS

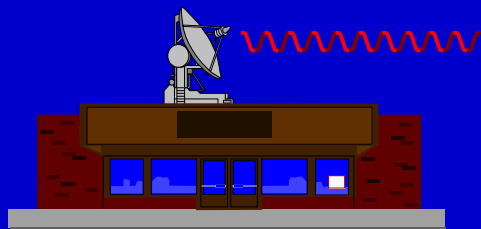
	ARDEC	ACALA	IOC	OTHER
Quality Engineering	X	X	X	
Software Quality Engineering	X			OSD & NATO
Experimentation/Instrumentation	X	X	X	
Testing Technology	X			FAA & USDA
Reliability Engineering	X	X	X	
Predictive Technology	X			OSD & NATO
Stockpile Surveillance	X		X	Navy/Marine
Environmental Engineering	X			
System Safety	X	X	X	
Explosive Hazards Classification	X	X	X	
Radiation Protection	X	X	X	
Product Data Management	X	X	X	DLA
Standardization	X	X		Navy/Marine
Product Quality Management	X	X		PEO GCSS
Quality Assurance	X	X		PEO GCSS

MAJOR FUNCTIONS - TIME PHASED





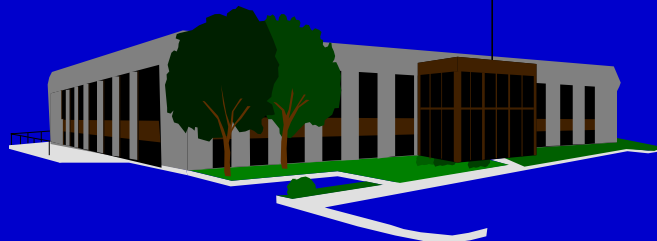
**Bldgs 60,
3106
Environmental Testing**



Bldg 62

**Direct Fire / Fire Control
Team Quality Evaluation &
Safety Team Indirect Fire &
Experimentation Team
Evaluation Technology &
Engineering Team**

FACILITIES



**Quality Engineering HQ
Bldg 92**



**ACALA QED Support
Rock Island, IL**



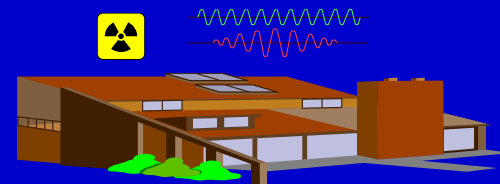
**Bldg 12
Product Data
Management**



**Radiation Protection
Bldgs 312, 319
320, 3030,**

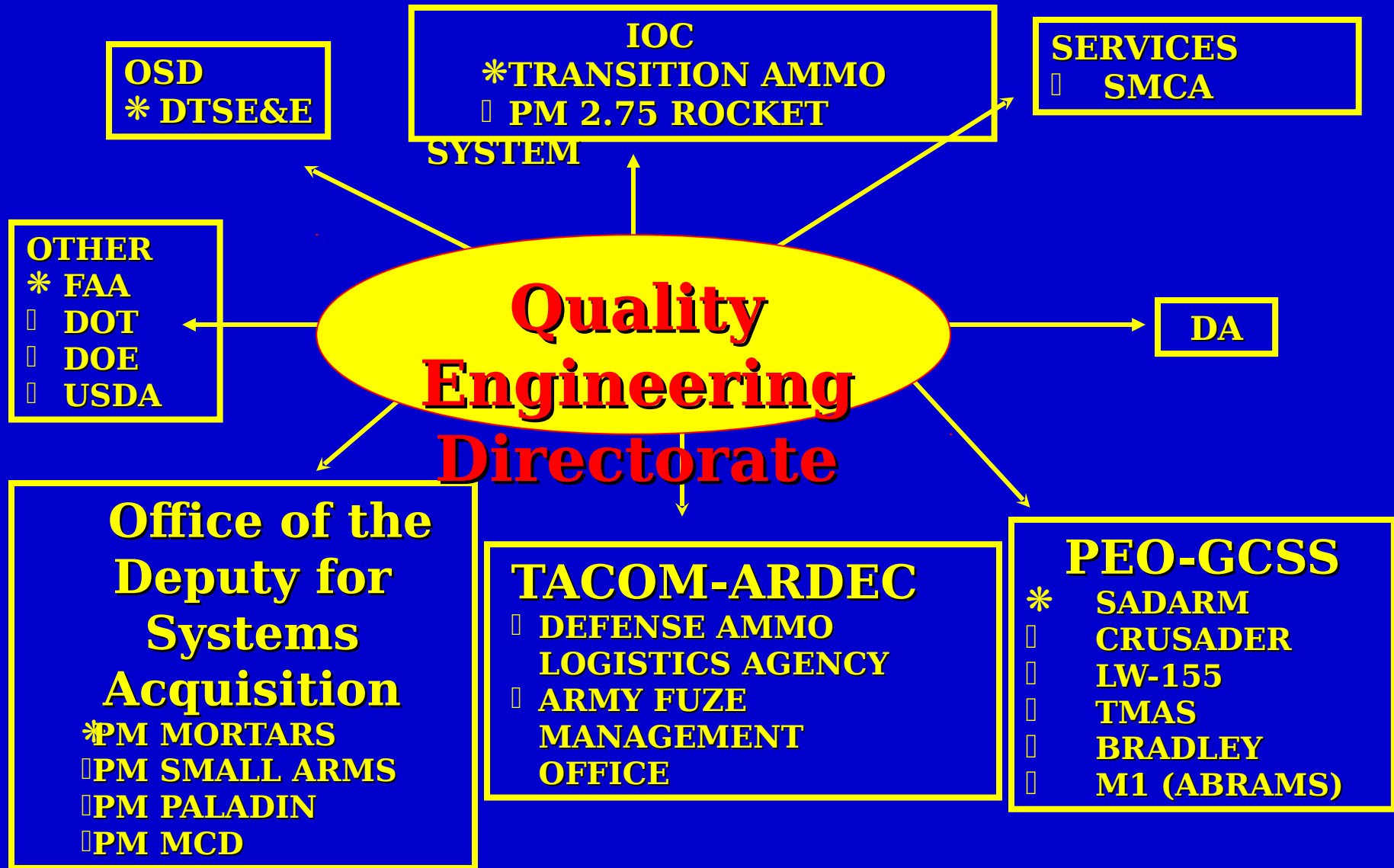


**Bldg 19
Soldering Tech
Ctr**



**Bldg 908
NDT & Radiography
Evaluation Technology
& Engineering Team**

QED CUSTOMERS



QED Support to Integrated Product Teams (IPT's) (74 IPT Teams)

AMSTA-AR-QAA AMSTA-AR-QAA	Allstaedt, Julius A. Barreiro, Antonio J.	FS10 CC01	*120MM Turreted Mortar LAV-M(S) M762E1/M767E1 (ET)Artillery Fuze Materiel Change Prgm	AMSTA-AR-QAC "IRIC"	Locascio, Rosario	CC74	XM992, 40mm Infrared Illuminant Cartridge
AMSTA-AR-QAA	Carchietta, Alfred R.	FS25	XM1007 (TERM-KE)Tank Extended Range Munition-Kinetic Energy	AMSTA-AR-QAC Mistry, Percy A.		CC56	MK19 Mod3 Grenade Machine Gun "GMG"
AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA	Carchietta, Alfred R. Carra, Dominick N. Eng, Sing Y.	FS35 FS14 CC76	PGMM, 120mm Precision Guided Mortar Munition M767 60MM Infrared (IR) Illuminating Ctg Acquisition Streamlining Integrated Process "ASI	AMSTA-AR-QAC Pragler, Edgar J. Jr. AMSTA-AR-QAC Sanchez, Camilo A. AMSTA-AR-QAC Sariti, Vincent M. AMSTA-AR-QAC Yuen, Ka C. AMSTA-AR-QAC-S Vu, Tin V. AMSTA-AR-QAT Ackerman, John J. AMSTA-AR-QAT Borshard, Larry D.		CC56 CC36 CC36 FS06 CC36 FS30 CC65	HYDRA 70 / 2..75 In. Rocket Systems HYDRA 70 / 2..75 In. Rocket Systems Gearless Turret and Gun Drives "GTGD" HYDRA 70 / 2..75 In. Rocket Systems Low Cost Competent Munitions "LCCM" Objective Individual Combat Weapon, ATD
AMSTA-AR-QAA	Eng, Sing Y.	FS41	DPICM/ 105mm Cartridge XM915/XM916/XM80/				
AMSTA-AR-QAA M898	Figueroa, Samuel H.	FS22	155MM Sense and Destroy Armor "SADARM"	AMSTA-AR-QAT "OICW"	Eng, Adriana L.	WE9	Miles 2000
AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA	Fong, Chi C. Holmes, Clifford R. Laidig, Beverly J. Marek, Gerald Meisinger, William L. Moratz, Martin M. Moratz, Martin M. Munoz, Jorge A.	FS11 WE7 FS11 FS15 FS09 WE7 WE8 FS18	Crusader Armaments Over-Arching Mortar HE Melt Pour / 81mm Crusader Armaments M931, 120Mm Mortar Full Range Practice XM982 Extended Range Projectile Over-Arching Mortar HE Melt Pour / 81mm Over-Arching Mortar HE Melt Pour/ 120mm 120mm Mortar M933/M934/M934A1 High Explosive Cartridges Over-Arching Mortar HE Melt Pour/ 120mm DPICM/ 105mm Cartridge XM915/XM916/XM80/	AMSTA-AR-QAT Katz, David G. AMSTA-AR-QAT Martinelli, Joseph N. AMSTA-AR-QAT Persau, Edward C.		FS08 FS02 FS43	M795 155MM HE XM95 Mortar Fire Control System Canister Launched Area Denial System "CLADS" / Non Lethal
AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA	Munoz, Jorge A. Murphy, Daniel W.	WE8 FS41		AMSTA-AR-QAT Phung, Robert V. AMSTA-AR-QAT Schenk, Kenneth C. AMSTA-AR-QAW Boyle, Rose Ann AMSTA-AR-QAW Fliszar, Rich AMSTA-AR-QAW Fliszar, Richard W. AMSTA-AR-QAW Fliszar, Richard W. AMSTA-AR-QAW Fliszar, Richard W. "AKEC"		CC36 WE9 CC21 CC24 CC28 CC54 CC77	HYDRA 70 / 2..75 In. Rocket Systems Miles 2000 Cal .50, M903 "SLAP", M962 "SLAP" Close Combat Optics, M68 Sight 25mm , APFSDS-T, M919 Cartridge Machine Gun Optic, XM145 Telescope Advanced Kinetic Energy Cartridge Program
AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA	Ng, King S. Noble, Robert G. Pelino, Joseph Pelino, Joseph	FS44 FS17 CC61 FS37	Dual Use Mortar Fuze M766 Short Range Practice Cartridge Non Lethal Program XM311, Modular Crowd Control Munition "MCC	AMSTA-AR-QAW Fliszar, Richard W. AMSTA-AR-QAW Glover, Clarence AMSTA-AR-QAW Glover, Clarence AMSTA-AR-QAW Glover, Clarence AMSTA-AR-QAW Hill, Terrance L. AMSTA-AR-QAW Huntley, James G. AMSTA-AR-QAW Lopez, Christopher AMSTA-AR-QAW Lopez, Christopher AMSTA-AR-QAW Lopez, Christopher AMSTA-AR-QAW Papazoglou, Evangelos L. AMSTA-AR-QAW Papazoglou, Evangelos L. AMSTA-AR-QAW Peters, Charles R. P.E. AMSTA-AR-QAW Stevens, Larry A. AMSTA-AR-QAW Stevens, Larry A. AMSTA-AR-QAW Zarzycki, Henry J. AMSTA-AR-QAW Zarzycki, Henry J.	FS38 CC28 FS27 FS28 FS33 FS14 FS14 FS15 FS17 FS44 FS10 FS15 CC27 FS10 FS44 CC04 CC05	M67 Sight Unit for 120MM Mortar System 25mm , APFSDS-T, M919 Cartridge Selectable Lightweight Attack Munition "SLAM" XM150, Penetration Augmented Munition "PAM" MDI Modernized Demolition Initiators M767 60MM Infrared (IR) Illuminating Ctg M767 60MM Infrared (IR) Illuminating Ctg M931, 120Mm Mortar Full Range Practice M766 Short Range Practice Cartridge Dual Use Mortar Fuze *120MM Turreted Mortar LAV-M(S) M931, 120Mm Mortar Full Range Practice 25mm TPDS-T, M910 Cartridge(M910E1) *120MM Turreted Mortar LAV-M(S) Dual Use Mortar Fuze 25mm Break-Up Ammunition "BUA" CTG 25mm,M790 Series(M791,792,793,794) for M242 Chain Gun	
AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA AMSTA-AR-QAA M898	Reynolds, James H. Jr. Smith, William L. Spielzinger, Michael Thiesing, August W. Tsui, Stephen P.	FS10 FS09 FS14 FS08 FS22	*120MM Turreted Mortar LAV-M(S) XM982 Extended Range Projectile M767 60MM Infrared (IR) Illuminating Ctg M795 155MM HE 155MM Sense and Destroy Armor "SADARM"	AMSTA-AR-QAW Farmer, Jerry AMSTA-AR-QAW-S Larsen, A.		CC54 FS08	Machine Gun Optic, XM145 Telescope M795 155MM HE
AMSTA-AR-QAA Change Prg	Weissenberger, Timothy	CC01	M762E1/M767E1 (ET)Artillery Fuze Materiel				
AMSTA-AR-QAA AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC	Wells, Richard A. Barrieres, Steven E. Chan, Richard C. Cichucki, Leonard J. Dellicker, Robert J.	FS11 CC24 CC36 CC41 CC67	Crusader Armaments Close Combat Optics, M68 Sight HYDRA 70 / 2..75 In. Rocket Systems M249 Squad Automatic Weapon "SAW" Multi-Role Anti-Armor Anti-Personnel Weapon Sys"RAAWS/MAAWS"				
AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC AMSTA-AR-QAC	Douglas, Richard J. Douglas, Richard J. Eichhorn, William P. Eichhorn, William P. Galecki, Sergio E. Galecki, Sergio E. Lindenbaum, Mark J. Locascio, Rosario Locascio, Rosario	CC41 CC75 CC21 CC27 CC27 CC28 FS38 CC11 CC57	M249 Squad Automatic Weapon "SAW" Caliber .50 Sniper Rifle, XM107 Cal .50, M903 "SLAP", M962 "SLAP" 25mm TPDS-T, M910 Cartridge(M910E1) 25mm TPDS-T, M910 Cartridge(M910E1) 25mm , APFSDS-T, M919 Cartridge M67 Sight Unit for 120MM Mortar System 40mm High Velocity (HV) Grenades MK93 Dual Mount	No. of rows identified for AMSTA-AR-Q: 82			

No. of rows identified for AMSTA-AR-Q: 82

Committed to Excellence

SPECIAL FUNCTIONS

■ TACOM-ARDEC Responsibility

- Materiel Release Review Board (Chair)
- TACOM-ARDEC Technical Test Readiness Review
- System Safety Demonstration Process
- Contractor Performance Certification Process (CP)²

■ International Standards Program

- U.S. Principal for AC/310 - Safety & Suitability for Service of Munitions & Explosives
- Support U.S. Principal for NATO AC/250 Group of National Directors for Quality Assurance Support
- Head of U.S. Delegation, ABCA QWG/MATS

Business Units Within QED



Key Functional Areas

COMMODITY CENTERS

Fire Support
Close Combat
Materiel Release
System Safety
Propellants & Explosives
Software Quality Engineering
Failure Analysis
Packaging
Reliability/Statistics
RAM/CPC

SUPPLIER BASE

(CP)²
First Article
Contract Management
Scratch & Digs
Standardization
Soldering

EVALUATION TECHNOLOGY

Nondestructive Evaluation
Dimensional Testing
Physical Properties
Predictive Technologies
Stockpile Reliability
Dual-Use Technologies
Software Assessment
Environmental

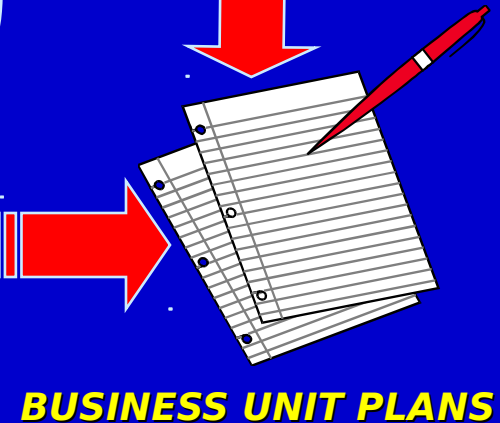
LINKAGES OF GOALS & PLANS

TACOM-ARDEC

Vision: Provide Overwhelming Firepower for Decisive Victory

Strategic Goals:

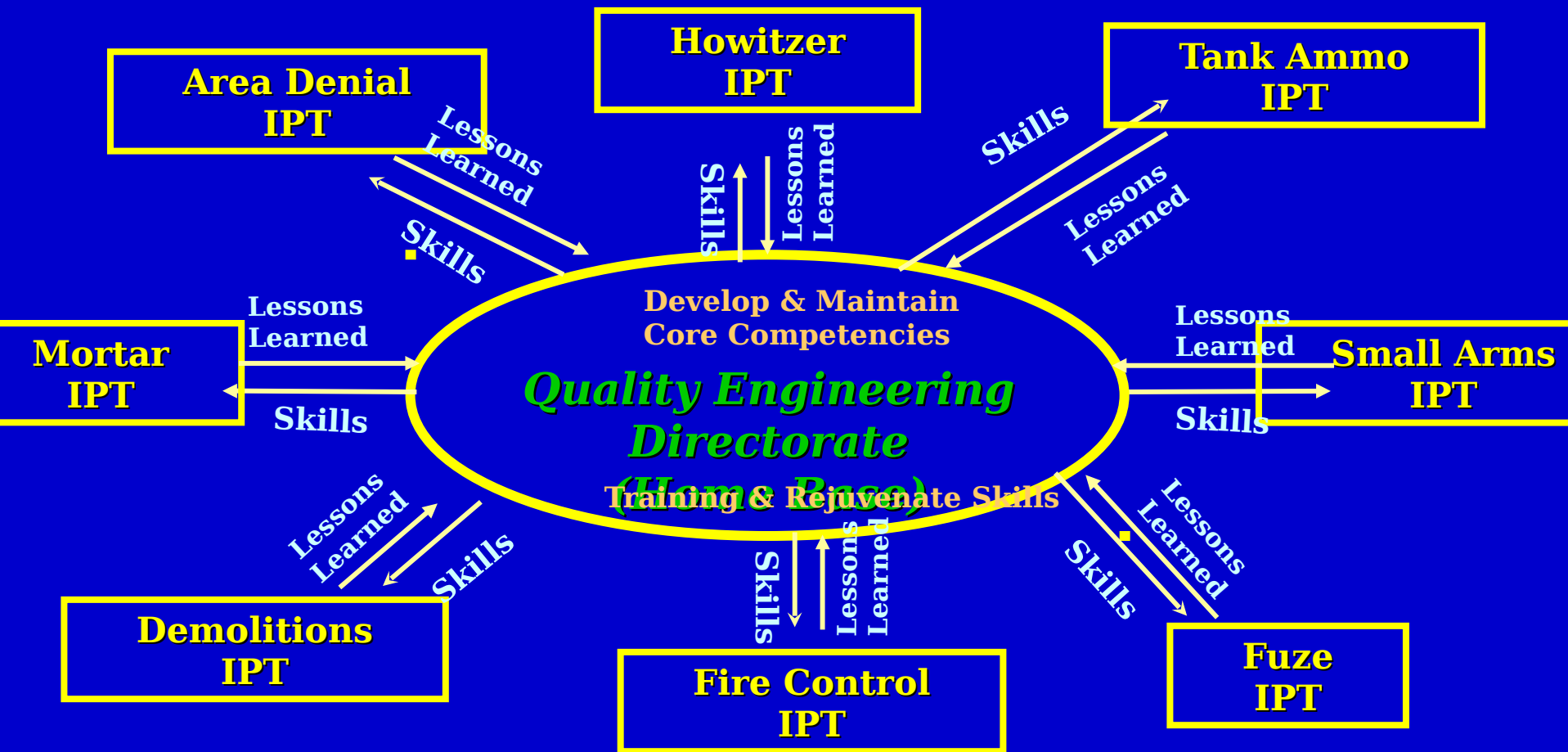
1. Be the Armament "Center of Excellence"
2. Quickly Meet Customer Needs
3. Strengthen our Customer Base
4. Continuously Improve the Efficient Use of Resources
5. Foster Teamwork and Employee Involvement
6. Be a Good Neighbor
7. Cause no Risk to Public Health, Safety or the Environment



QED Goal	Mapping
Provide the highest standards in quality engineering with timely and cost effective services to our customers.	1 4
Assure independent assessment of development and production programs throughout the materiel acquisition life cycle.	1 7
Develop employees as team members supporting acquisition reform through integrated product teams.	2 5
Maintain state of the art facilities, capabilities, and technologies.	6
Provide outstanding support to the field.	1

Committed to Excellence

Home Base & Support to IPTS

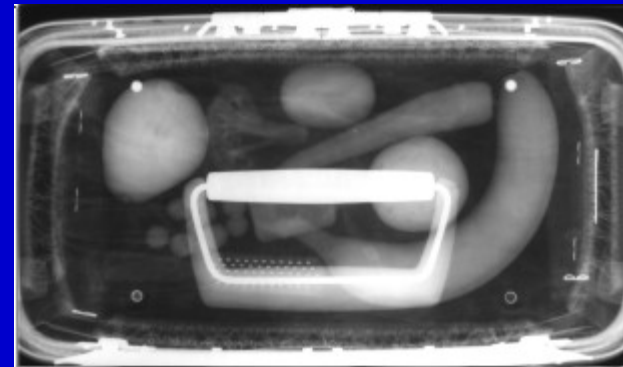


Entrepreneurial Examples



Contractor Performance Certification Program

- **Promotes World Class Supplier Base**
- **Government/Industry Partnering**



Non Destructive Evaluation Automated Baggage Inspection System

- **Dual Use**
 - **Armament Products**
 - **Explosives**
 - **Fruits & Vegetables**

Quality Engineering Directorate is...

- **YOUR INDEPENDENT QUALITY/TECHNICAL ASSESSOR OF ALL TACOM-ARDEC COMMODITIES**
- **THE AMC LEADER IN QUALITY INITIATIVES**
 - **CONTRACTOR PERFORMANCE CERTIFICATION PROGRAM (CP)², QUALITY SUPPLIER LIST (QSL)**
 - **SAFETY CHARACTERISTIC POLICY**
 - **PEOPLE SENSITIVE PROCESS**
 - **PROACTIVE TO REDUCE FAILURES FOR SMALL REASONS**
 - **CONTINUOUS QUALITY IMPROVEMENT PARTNERSHIP**
- **CUSTOMER FUNDED AND FISCALLY SOUND**
- **TRULY A VALUE ADDED ORGANIZATION TO TACOM-ARDEC**

QED VALUE ADDED THRU NEW INITIATIVES

- **QUALITY ENGINEERING - FIRST PRIORITY, NOT LAST**
- **PROVIDES ARDEC WITH A DIFFERENT "VOICE"**
- **WORLD CLASS SOFTWARE QUALITY ENGINEERING**
- **HOME BASE CORE COMPETENCIES PROVIDE
QUALITY SKILLS FOR OUR CUSTOMERS**
- **PROVIDES FOR AN INDEPENDENT:**
 - **SYSTEMS SAFETY PROCESS**
 - **MATERIEL RELEASE PROCESS**
- **ENDORSES TACOM-ARDEC's QUALITY IMAGE**

"WE MAKE OUR PRODUCTS BETTER!"